

**SERIES:** VWRBS3 | **DESCRIPTION:** DC-DC CONVERTER

**FEATURES**

- 3 W isolated output
- wide input (2:1)
- industry standard 8 pin SIP package style
- single unregulated outputs
- 1,500 V isolation
- short circuit protection
- wide temperature (-40~85°C)
- efficiency up to 81%


**MODEL**

MODEL	input voltage		output voltage (Vdc)	output current		output power max (W)	ripple and noise <sup>1</sup> typ (mVp-p)	efficiency typ (%)
	typ (Vdc)	range (Vdc)		min (mA)	max (mA)			
VWRBS3-D12-S5-SIP	12	9~18	5	60	600	1	100	74
VWRBS3-D12-S9-SIP	12	9~18	9	33	333	1	100	76
VWRBS3-D12-S12-SIP	12	9~18	12	25	250	1	100	78
VWRBS3-D12-S15-SIP	12	9~18	15	20	200	1	100	80
VWRBS3-D24-S5-SIP	24	18~36	5	60	600	1	100	76
VWRBS3-D24-S9-SIP	24	18~36	9	33	333	1	100	78
VWRBS3-D24-S12-SIP	24	18~36	12	25	250	1	100	80
VWRBS3-D24-S15-SIP	24	18~36	15	20	200	1	100	81

Notes: 1. ripple and noise are measured at 20 Hz BW

**PART NUMBER KEY**
**VWRBS3 - DXX - SXX - SIP**

Base Number

Input Voltage

Output Voltage

Packaging Style

**INPUT**

parameter	conditions/description	min	typ	max	units
operating input voltage	12 V model	9.0	12	18.0	Vdc
	24 V model	18.0	24	36.0	Vdc

**OUTPUT**

parameter	conditions/description	min	typ	max	units
voltage accuracy	positive		±1	±3	%
	negative		±2	±5	%
line regulation	measured from low line to high line		±0.2	±0.5	%
load regulation	measured from 10% to 100% full load		±0.5	±0.75	%
switching frequency	100% load, nominal input voltage		300		kHz
temperature coefficient				±0.03	%/°C

**PROTECTIONS**

parameter	conditions/description	min	typ	max	units
short circuit protection	continuous, automatic recovery				

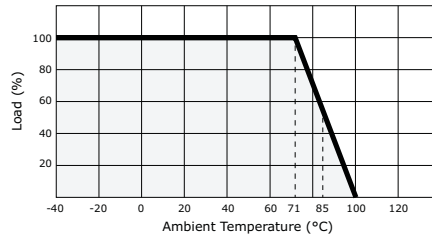
**SAFETY AND COMPLIANCE**

parameter	conditions/description	min	typ	max	units
isolation voltage	tested for 1 minute at 1 mA max.	1,500			Vdc
insulation resistance	at 500 Vdc	1,000			MΩ
isolation capacitance	100 kHz, 1V		80		pF
RoHS compliant	yes				
MTBF	MIL-HDBK-217F, 25°C	1,000,000			hours

**ENVIRONMENTAL**

parameter	conditions/description	min	typ	max	units
operating temperature		-40		85	°C
storage temperature		-50		125	°C
storage humidity	non-condensing			95	%
temperature rise	at full load		15		°C
lead temperature	1.5 mm from case for 10 seconds			300	°C

## DERATING CURVE



## MECHANICAL

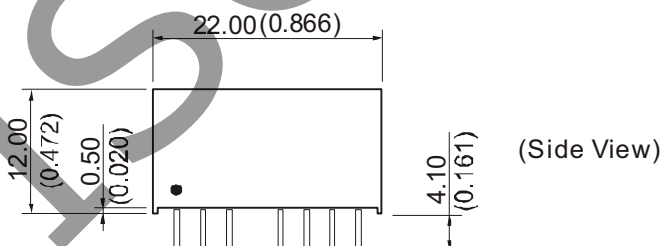
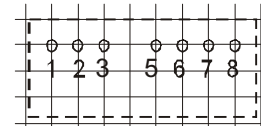
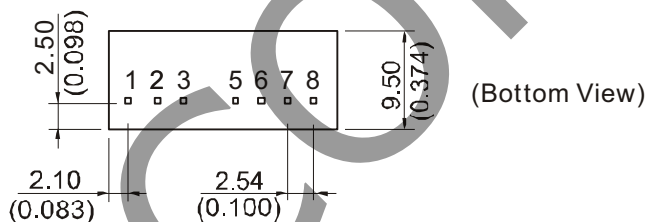
parameter	conditions/description	min	typ	max	units
dimensions	0.866 x 0.374 x 0.472 (22.00 x 9.50 x 12.00 mm)				inch
case material	Plastic (UL94-V0)				
weight			6		g

## MECHANICAL DRAWING

units: mm (inches)  
 tolerance: ±0.25 (±0.010)  
 pin section tolerance: ±0.10 mm (±0.004)

First Angle Projection

RECOMMENDED FOOTPRINT  
 Top view, grid: 2.54mm (0.1inch)  
 diameter: 1.00mm (0.039inch)



PIN CONNECTIONS	
PIN	FUNCTION
1	-Vin
2	+Vin
3	CTRL
5	NC
6	+Vo
7	-Vo
8	CS

## APPLICATION NOTES

-All of the VWRBS3 Series have been tested according to the following recommended testing circuit before leaving the factory. This series should be tested under load (Figure 1). If you want to further decrease the input/output ripple, you can increase capacitance properly or choose capacitors with low ESR. However, the capacitance should not be too high (Table 2).

**CS Capacitor Table (Table 1)**

Vout	5V	9V	12V	15V	24V
CS	47uF-100uF		10uF-47uF		

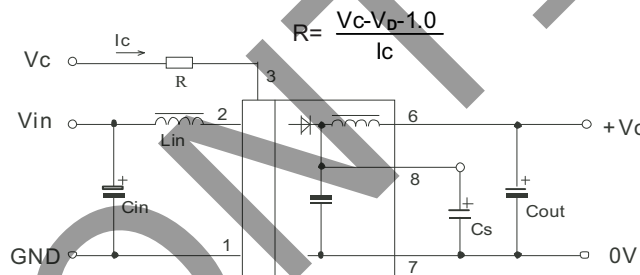
**External Capacitor Table (Table 2)**

Vout	Cout/μF (max)
5 V	1000
9 V	680
12 V	470
15 V	330

### 1. NCs Terminals

Unless otherwise specified, NC terminals of all series are used for converter's interior circuit connection, and are not allowed connection of any external circuit

#### RECOMMENDED CIRCUIT (Figure 1)



**CS Pin-**By connecting a low ESR capacitor between this terminal and the pin-7 (Figure 1). the output ripple and noise may be further improved. Generally, the capacitance is no greater than 47uF.

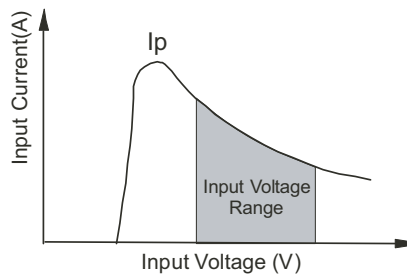
### 2. CTRL Terminal

When open or high impedance, the converter will work well; When this pin is 'high'; the converter will shutdown; It should be noted that the input current should remain between 5-10mA, exceeding the maximum 20mA will cause permanent damage to the converter.

### 3. Input current

Nominal input voltage range. The input current of the power supply must be sufficient to the startup current (Ip) of the DC/DC module. (Figure 2)

**Figure 2**



### 4. Output Load

In order to ensure the product operates efficiently and reliably, make sure the specified range of input voltage is not exceeded.

**No parallel connection or plug and play.**

## REVISION HISTORY

rev.	description	date
1.0	initial release	07/27/2007
1.01	updated to new template	05/27/2009
1.02	new template applied, V-Infinity branding removed	09/11/2012

The revision history provided is for informational purposes only and is believed to be accurate.



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